

## The Land Laboratory Method of Teaching

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### **Abstract**

*The need for teachers to be effective in producing desired results in the learner using organized and acceptable ways or methods of teaching at all levels of education necessitated land laboratory method be used in teaching Agricultural Science in schools. Land laboratory as a method of teaching is only known than ever used to such an extreme that one would begin to doubt if the teachers really know the efficacy of land laboratory in the teaching profession. Therefore, this paper x-rays the concept of land laboratory, purposes, importance, shortcomings, principles and procedure in utilizing land laboratory by teachers in schools.*

**Key words:** Land Laboratory, Agricultural Science Teacher, Learner Education

### **Introduction**

Teaching is a process by which a more experienced person-teacher deliberately exposes a less experienced person-learner to planned activities and opportunities in a discipline to enable him acquire desired knowledge, skills, attitude and value that will make him become useful in the society. During the process, teachers make use of different organized ways or manner that have been identified, tested and generally accepted by earlier researcher such as Plato, Socrates, Aristotle and other educators to be effective in producing desired results in learners. Such ways are generally referred to as methods of teaching. In education, there are several methods of teaching ranging from lecture, discussion, demonstration, project, field trip to land laboratory. Each of the aforementioned methods of teaching are important to both teachers and learners in one way or the other with their shortcomings especially when their principles and procedures are well observed during usage.

However, it is very clear that the purpose of each method can hardly overlap one another entirely for one to believe the use of the other in education is irrelevant. This is why one gets marveled when teachers at all levels of education teach students agricultural science for several years without using land laboratory for one day. In fact, land laboratory as a method of teaching is only known than ever used to such an extreme that one would begin to doubt if the teachers really know the efficacy of land laboratory in the teaching profession. Therefore, it is necessary to x-ray the concept of land laboratory, purposes, importance, shortcomings, principles and procedure in utilizing land laboratory by teachers in schools. It is believed that this will probably remind or expose the efficacy of land laboratory in the teaching-learning process to teachers for utilization.

### **Concept of Land Laboratory**

The concept of land laboratory, which is school farm, has been defined by many authorities on education based on their own perspectives. For instance, Agbulu and Wever (2011) defined land laboratory as basically the learning activities that equip students with practical skills and theoretical knowledge on how to do things with their hands using materials that could be seen and touched. The authors viewed that through practice, the students acquire salable skills that would enable them fit in properly in the world of work after graduation. Osinem (2008) viewed it as a learning experience that engages the students actively in practical skill activities of concepts learnt and at the same time help them to discover the appropriate way of doing things by themselves. For instance, how to test soil, plant crops, remove weeds, apply fertilizer on crops, harvest crops and culture fish in ponds. The author explained that when students are given a substantial amount of practice in finding solutions to problems, they are challenged to grasp the structure of a field of study, develop solving skills and confidence as well as propensity to function later in life as problem solvers. Thus, students learn best by doing not just by sitting and listening to talk and taking notes on such talks.

In the same vein, Omosewo (1994) stated that land laboratory equips students with salable skills that would enable them to be job creators rather than job seekers. It stimulates students' interest and passion for agriculture which would help them solve their individual real life problems. For instance, a student may be interested in eating cow meat or eggs but fears going near the cow because of its size and horns or going near poultry house because of the offensive odour.

In any case, the definition may not be clearly explained without ascertaining the contextual definition of land (farm). United States Department of Agriculture (USDA, 2014) described land as a farm and its buildings used for the growing of crops (plants) and rearing of livestock (animals) and the people who work on the land are called farmers. Therefore, land laboratory as a method of teaching is an academic enterprise whereby a teacher takes the students to the school land laboratory and guides them on how to learn things by doing, using hands and physical objects.

### **Basic Purposes of using Land Laboratory Method in Education**

Land laboratory method of teaching is meant to serve certain fundamental purposes in education among which include to:

1. impart agricultural knowledge and managerial skills to students in the school through practice;
2. form right habits and thinking necessary for success in any relevant agricultural occupation;
3. train students directly in the thinking habits and manipulative skills required in farm production outside the school;
4. make students capitalize on their interests, aptitudes and intrinsic intelligence with reference to their chosen agricultural occupations to enhance learning;

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5. equip students with knowledge and skills to be job creators instead of job seekers after graduation;
6. justify the relationship between what is taught to students in the classroom and what is happening in the world of work by integrating theoretical knowledge with practice, (Agbulu and Wever, 2011).

### **Importance of Land Laboratory Method in Education**

The importance of land laboratory method includes:

1. Equips students with the skills for transfer of knowledge. Students come to school from their parents especially those from farming families with some learning experiences in agricultural activities. In the land laboratory, they learn more about improved ways of carrying out agricultural activities which they usually transfer to their family farms. Through this process many farmers (parents) in the community can learn and adopt modern farming technologies which in turn would improve their agricultural productivity.
2. Helps to inculcate into the students the need to value what they could do or produce by themselves and for themselves. Students are made to use their heads, hands and hearts during agricultural activities in the land laboratory to produce crops or livestock. The respect for dignity of labour is built into them through this process. They also learn to protect the farm from predators, pests, diseases, human invaders, store farm products for sale. (Osinem, 2008).
3. Exposes students to research work in the land laboratory. The school land laboratory harbors many plants and livestock's that are of special interest to other related subjects like biology, chemistry, physics and mathematics. For teaching and learning in biology, the specimens needed such as plant (tubers, stems, and leaves) and animals like rabbit and guinea pig may be obtained from the land laboratory. For instance, yam tuber could be obtained from school farm barn for teaching osmosis experimentally; fish could be obtained from the pond for teaching fish organs through dissection in the laboratory. Feeding habits of animals, respiration, blood circulation and others would be made easier to study in the biology laboratory where agricultural farm make the materials available. Leaf shapes of plant and their adaption to environmental factors could be studied better in the school farm during biology class.
4. In chemistry, land laboratory method makes it easier for students to obtain sample of plants that produce organic compounds for easy study of organic chemistry. It is easier to associate the smell of preparation of certain gases in the laboratory with odours from some agricultural products such as the smell of rotten eggs. This association may make the study of chemistry more meaningful, understandable, interesting and permanent to the students
5. In biology, it helps students to associate some laboratory experiments with materials and activities on the school land laboratory. For instance, in mechanics, the hoe could be used to teach mechanical advantage, the use of sticks for rolling logs could serve as an illustration of mechanical advantages. The spring balance and the weighing scale for weighing processed crop could be in physics laboratory for treading load, efforts and pulleys.

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6. It is used in mathematics to teach students how to recognize shapes and angles in laboratory using the school land laboratory as example. There are different shapes of plots on the school land laboratory such as rectangle and square which students can measure the angle of these shapes and their length and width for geometrical calculation.
7. Improves background knowledge of students. Most science subjects in the school such as physics, chemistry, biology and agricultural science are in two parts: theory and practical. In these subjects, students' knowledge in the theory may not help them to overcome or manipulate tasks or problems. Therefore, they require the practical aspects to compliment the theoretical knowledge in order to be a master of the subject, (Ushie, 2010).
8. Provides the much needed facilities for skill training in agriculture to compliment whatever background knowledge acquired in the classroom in order to develop in the students entry level skills for agriculture.
9. Develops skills in students, students acquire agricultural knowledge in the classroom in several areas like crop production forestry, soil conservation, livestock management, fish farming, agricultural business and farm management.
10. Equips students to interpret the acquired knowledge into practice in the school farm under the guidance of the teacher.
11. Helps for direct agricultural extension services. Land laboratory is the most meaningful and interesting place to the farmer as far as the school is concerned. On a visit to the school, a farmer is most likely to spend a longer time in the school farm more than in any other department or unit. The farmer is highly interested in the growth of the varieties of crops in the land laboratory and the performance of livestock in their pen or fish in the pond. He is eager to learn about the management of those crops and livestock, and therefore, asks series of educative questions that are usually answered by agricultural science teacher or farm attendant or even students undertaking their practical assignments. Through this process, the farmer learns about what he does not know in agriculture.
12. Helps both teachers and students to develop skills for creative thinking. Land laboratory can be a source of aesthetics that is beauty at certain times of the year, especially during the growing and flowering periods of crops. The regular (equal) plant spacing of crops in the school farm provides an interesting and inviting outlook to passerby as different shapes exhibited by growing crops such as yams, maize, cassava, rice, okra and tomatoes present an interesting outlook. The various adaptations for existence exhibited by the growing crops or ornamental plants invite creative thinking in people.
13. Promotes students retention of knowledge and skills as it has been proven that people can remember about 70 percent of what they hear, see and do. (Maduewesi, Ezeani and Maduewesi, 1999). That is, it makes learning more practical and permanent in students for use in future.

### **Shortcomings of Land Laboratory Method in Education**

Land laboratory is not exception to the belief that whatever has advantages also have disadvantages. The shortcomings of land laboratory method of teaching in education are as follows:

1. It is very expensive to execute. Certain amount of money is needed by the teachers to communicate and rally round in planning, organizing, implementing and coordinating the efforts of the students towards achieving the main objectives of the school in agricultural development.
2. It is time consuming to plan, organize, implement and evaluate. Land laboratory teaching requires a lot of time for both teachers and students in terms of time to perform the actual practicals such as planting, weeding, fertilizer application, harvesting and processing. In spite of the emphasis placed on agricultural science as one of the core subjects, there is usually not enough time in the time-table for meaningful practical work in agriculture. Hence the prosecution of a functional education in relation to agricultural science in secondary schools still leaves much to be desired.
3. It exposes the students to perform most of their agricultural activities communally. This tends to diminish the zeal and commitment of some of the students in the practice of agriculture in schools.
4. The protocol required to execute land laboratory method of teaching may be tasking and boring to teachers. It involves a lot of procedure, money and letters to obtain permission from the school authority to procure materials and equipment for the practical work. Sometimes the nonchalant attitude of some school authorities tends to retard genuine efforts of some teachers of agriculture for the improvement of practical activities.
5. It exposes both teachers and students to high risk of accident which may lead to injury or loss of life. In the land laboratory, there are activities that can lead to high possibilities of accident by the teacher during demonstrations and participation by the students if proper supervision is not carried out.
6. It is highly prone to abuse by teachers. Since there is financial or monetary involvement, some teachers may use the school administrator to enrich themselves, thereby sidelining the objective of the method in education.

### **Principles of Land Laboratory Method in Education**

Principles, according to Hornby (2010) refer to laws, rules, guidelines or theories that something is based upon. In this context, principles are basic and important rules and regulations underlying the use of land laboratory in education for effective teaching. Such principles are stated as:

1. Teachers should obtain permission from the school authority and students before embarking on a land laboratory work.
2. The land laboratory must have high and relevant educative settings other than what is obtainable in the indoor laboratory.

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3. The head of department of agricultural science should involve students and other agricultural science teachers in planning, organizing and executing of land laboratory work so that they could see the value themselves.
4. Adequate provision of materials and equipment should be made to allow each student participate actively during practical activities in the land laboratory.
5. There should be appropriate report by both students and teachers after every land laboratory practical. Major activities should be well documented for future use.
6. The land laboratory (school farm) should be an area in the school or at a fairly walking distance to the school, specifically marked with different shapes, designs and purposes for agricultural activities within or outside the school settings. This area possesses the potentials required for agricultural productivity.

### **Procedure in Land Laboratory Method of Teaching**

In the statement of Hornby (2010), procedure is an established or correct way of doing something. Therefore, procedure here refers to the correct ways of carrying out land laboratory method of teaching starting from planning, organizing, implementing to evaluating it for effective teaching of a topic or subject to students. It involves all the practices that should be performed by a teacher to ensure that students are effectively exposed to the desired experience and knowledge in their subject of study using land laboratory method of teaching. The procedures are stated as follows:

1. Identify the objectives of the topic you want to achieve using land laboratory method of teaching. This is necessary because it helps to decide which aspect of the topic the teacher wants to emphasize.
2. Explain to the students the importance of the task to be performed and relate it to what the students already know, that is students' previous experience of the concepts.
3. Get ready the equipment and materials necessary to ensure a smooth and uninterrupted activity and every material needed should be in its own position.
4. All the materials needed should be available so that one does not stop on the way when performing because one item needed is not available. Such interruption would reduce the interest of the students and could be difficult to regain.
5. Motivate the students by knowing what to perform, how to begin and end it so as to sustain students interest and confidence in the activities.
6. The teacher should perform the task slowly to bring out the main point, giving explanation as an important part of the task. This helps to know whether the teacher planned too little or much for the time assigned for the task.
7. Use simple understandable and correct language the students can easily understand. This ensures that every student is carried along in the activities.
8. There should be outline of tasks into logical stages. Young students' tasks should be limited to few stages and complete outline to the older students. The task must be within the basic experience and ability of the students and there should be enough time for the tasks to be completed.
9. The teacher needs to speak clearly, distinctly and not too fast. Performs the task with highest degree of skill to develop manipulative skills in students. This is important

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because it arouses student's interest and retains their attention to the task done by the teacher.

10. Use of same tools and materials that would be used by the students in their work. Since students are familiar and are used to these tools and materials, they practice the task without difficulties. Talk to the students and not the equipment in use (Laogun, 1981).
11. Working and using tools with handles should be cleaned after use and returning the tools to their appropriate tool cabinets.
12. Divide the students into groups of convenience if the population is large for clear observation and active participation of the students during the activities. Assign a leader to each group for coordination and controlling of students' behaviour during operations.
13. Chemicals should be carefully handled and use of protective covering during operations. Use of less persistent chemicals like pesticides should be applied to fresh fruits and vegetables.
14. Animals should be kept in special cages, pens and preferably away from the normal working area of the laboratory. This is to prevent animals kept in the laboratory from causing much health hazards and transmit dangerous micro-organisms by bites or even through playing with them.
15. The teacher should get the students used to the use of protective clothing and shoes used in land laboratory, (Osinem, 2008).

## Conclusion

Land laboratory teaching is one of the methods of teaching that is generally accepted in education. It involves taking students by a teacher to the land laboratory (school farm) expose the students to first-hand knowledge and real life practical skills in agriculture to be job creators and not job seekers. The use of land laboratory method by teachers in schools has some restrictions among which include the procedures that could be followed to carry it out effectively without abusing the objectives. Therefore, the procedures submitted in this work are very effective as they have been followed to produce desired results with little or no modifications to suit the individual teacher based on individual differences.

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